

### ABSTRACT OF THE DISCLOSURE

A new differential technique and system for imaging dynamic (fast moving) surface waves using Dynamic Interferometric Synthetic Aperture Radar (InSAR) is introduced. This differential technique and system can sample the fast-moving surface displacement waves from a plurality of moving platform positions in either a repeat-pass single-antenna or a single-pass mode having a single-antenna dual-phase receiver or having dual physically separate antennas, and reconstruct a plurality of phase differentials from a plurality of platform positions to produce a series of desired interferometric images of the fast moving waves.